

Colostrum Density in Boy and Girl-Delivered Mothers

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Abstract

The aim of this study was to evaluate the differences of colostrum density between left and right breasts and between mothers of boy and girl infants. A cross sectional study was carried out in 34 boy-delivered mothers and 34 girl-delivered mothers aged 16 to 36 years conducted at the Izadi and Al-Zahra Hospitals in Qom city, Iran, for delivery. Colostrum was collected from both breasts by manual milking within the first day of delivery. The colostrum density was calculated as weight (g) divided by volume (ml). The data was analysed through the student's t-test using the SPSS program. Colostrum density of both left and right breasts were higher in the boy-delivered mothers than that in the girl-delivered mothers. It was non-significantly higher in left breast than in right breast. The results of the present study suggested that the density of colostrum in the boy-delivered mothers is greater than that in the girl-delivered mothers.

Keywords

Colostrum; Density; Breast; Infant

Introduction

Colostrum (also known as first milk or "immune milk") is a form of milk produced by the mammary glands of mammals in late pregnancy and the few days after giving birth. Colostrum is thick lemon yellow and lasts for 2-4 days after the lactation has started (Thapa, 2005). Newborns have very weak digestive systems, and colostrum delivers its nutrients in a much concentrated low-volume form. It is important for the nutrition, growth, and development of newborn infants to contribute to the immunologic defense of neonates. The composition of breast milk changes to meet the specific needs of the growing infant. Colostrum and milk can influence cell growth, differentiation, and function (Mastroeni et al., 2006; Palmer et al., 2006). Colostrum is high in carbohydrates, protein, micronutrients in the form of vitamins and minerals as well as other bioactive molecules, including growth factors according to need of neonates and low in fat (as human newborns may

find that it is difficult to digest fat) (Playford et al., 2000; Thapa, 2005; Palmer et al., 2006).

Mothers may not breast-feed for numerous reasons (Moulden, 1994), such as previous difficulty with breast-feeding, knowing someone who had difficulties, perceived nipple anomalies (inverted nipples), or previous breast reduction or augmentation surgery. Even the mother who intends to breast-feed may be dissuaded by incidents such as embarrassment during early attempts or lack of the milk ejection (let-down) reflex. This reflex, which moves milk to the areolae, is inhibited by pain, anxiety, stress or smoking and may cause the mother to abandon her efforts to breast-feed. So alternate safe colostrum or milk is required. Though infant formulas have tried best to mimic breast milk as closely as possible, yet it is difficult to produce a formula equivalent in all respects to breast milk for boy and girl infants, because its exact chemical composition is not yet known (Redel and Shulman, 1994; Stehlin, 1996). There were a few reports about colostrum and milk differences between boy-delivered mothers and girl-delivered mothers. It was shown that milk production in boy-delivered mothers is greater than that in girl-delivered mothers (Kent et al., 2006). So in the first step it is determined whether colostrum density for the boy-delivered mothers differs from that for the girl-delivered mothers.

Materials and Methods

Subjects

This cross sectional study involved thirty healthy boy-delivered mothers (average age 25.4, ranging from 16 to 35 years) and thirty healthy girl-delivered mothers (average age 25.1, ranging from 17 to 36 years) admitted to Izadi and Al-Zahra Hospitals in Qom city, Iran, for delivery in summer 2010. All subjects had delivered healthy full term infants more than 2.5 kg, had less than two pregnancy precedents and did not

experience any complication during pregnancy and at delivery. The nutritional condition of each subject was judged to be good, based on clinical observations.

Informed consent was obtained from the mothers and the Ethics Committee of Qom University of Medical Sciences, Qom, Iran, approved the study protocol.

Colostrum Collection and Analysis

After the hands got washed with water and soap, the colostrum was collected from both breasts by manual milking within two days after delivery. Approximately, 1 ml from each breast was obtained directly into clean polyethylene bottles.

Volume and weight of colostrum of left and right breasts of each individual were measured and then the density (g/ml) was calculated (weight divided by volume).

Statistical Analysis

For statistical analysis, the data are presented as mean \pm SEM. The 2-tailed Student paired and unpaired t test was used. P less than 0.5 was considered statistically significant.

Results

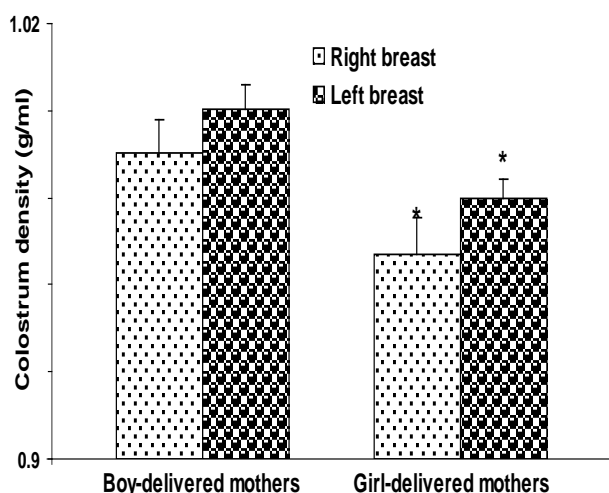


FIG. 1 LEFT AND RIGHT BREAST COLOSTRUM DENSITY (MEANS \pm SEM). *DIFFERENT FROM BOY-DELIVERED MOTHERS, $P < 0.05$

The mean colostrum density of the boy and girl-delivered mothers has been shown in figure 1. There were significant differences in the mean left and right breast colostrum density between the boy and girl-delivered mothers ($p < 0.05$). Colostrum density of both left and right breasts were higher in the boy-delivered mothers than that in the girl-delivered mothers. It was non-significantly higher in the left breast than in the

right breast.

Discussion

Colostrum has been universally acknowledged as the perfect first food for infants (Cox, 2006). Human colostrum is an important source of protective, nutritional and developmental factors for the newborn. The aim of this study was to compare the level of colostrum density in the mothers of boy with mothers of girl infants. It was found that on average, colostrum density in mothers of girl infants was lower than that in mothers of boy newborns, and that in the left breast was higher than in the right breast.

Differences in milk production of right and left breasts have been noted previously (Cox et al., 1996; Hill et al., 2007). It has been shown that there was a significant difference between breasts, with the right breast more productive (Cox et al., 1996; Mitoulas et al., 2002; Engstrom et al., 2007). It has been reported that the concentration of IgA milk obtained from the left breast was significantly higher than that obtained from the right breast (Weaver et al., 1998).

There were many reports about colostrum composition. Colostrum is relatively low in folate (Cooperman et al., 1982), calcium and phosphorous (Mastroeni et al., 2006), fat (Jansboy et al., 1981), but high in Zinc, Fe, K and Na (Higashi et al., 1982), vitamin E (Jansboy et al., 1981), Immunoglobulin A (Gapper et al., 2007), compared to mature milk. To our knowledge, there was no report about differences of colostrum composition between mothers of boy and girl infants and this study has provided the first analyzed survey on the colostrum density of Iranian mothers. Our data indicated that colostrum density in boy-delivered mothers is significantly higher than that in girl-delivered mothers. Kent et al showed a significant difference between the total breast storage capacity and milk production for mothers who were breastfeeding boys compared with those breastfeeding girls. The total breast storage capacity and milk production were greater in boy-delivered mothers (Kent et al., 2006). The results have suggested that the composition of colostrum seems to be different in the boy and girl-delivered mothers and the addition of different substances may be benefit in design of milk formulas for girl and boy infants.

Our research has not planned for day-to-day collection of colostrum and milk, because resistance from the study participants was anticipated and experienced, so only one sample of colostrum was taken. There were

other limitations to this study, e.g., the other components of colostrum such as lipids were excluded from study. Further studies need to clarify the composition of colostrum or milk in mothers of boy and girl infants.

Conclusion

The results of the present study suggest that the composition of colostrum seems to be different in the boy and girl-delivered mothers and the left breast colostrum density is greater than the right and it is higher in the boy-delivered mothers.

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